

NON-PUBLIC?: N  
ACCESSION #: 8810060324  
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Callaway Plant Unit 1 PAGE: 1 of 4

DOCKET NUMBER: 05000483

TITLE: Reactor Trip Due To Personnel Error and Engineered Safety  
eatures  
Actuations Due To Valve Leakage  
EVENT DATE: 09/02/88 LER #: 88/010/00 REPORT DATE: 10/03/88

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR  
SECTION  
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:  
NAME: W.R. Robinson, Assistant Manager Operations & Mtnce  
TELEPHONE: 314/676/8293

COMPONENT FAILURE DESCRIPTION:  
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:  
REPORTABLE TO NPRDS:

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT: At 1323 CDT on 9/2/88, with the plant in Mode 1 - Power Operations at 100% reactor powers an unplanned reactor trip occurred followed by automatic actuations of Engineered Safety Features (ESF); specifically a Feedwater Isolation (FWIS) and an Auxiliary Feedwater Actuation (AFAS). This occurred due to cognitive personnel errors when a non-licensed Equipment Operator opened a potential transformer cabinet drawer. To prevent recurrence, the cabinet drawers will be locked with a controlled key. The training program will be revised to include the function of potential transformer fuses and associated interlocks. Progressive discipline has been initiated.

At approximately 1240 CDT on 9/3/88 during the subsequent startup, with the plant in Mode 1 - Power Operations at 8% reactor power, unplanned automatic ESF actuations (FWIS and AFAS) occurred. The cause of the actuation was a high 'D' Steam Generator level due to excessive seat leakage of the 'D' Feedwater Regulating Valve. The leakage is believed to be the result of either degradation of the valve seating surface or the valve plug not fully seating upon closure. Corrective actions included a visual inspection and stroke of the

'D' FRV, a visual caution to operators that the valve leaks excessively, and initiation of action to investigate the valve seat leakage during the next refueling outage. The plant was returned to full power at 2100 on 9/5/88.

END OF ABSTRACT

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#### Basis for Reportability

This Licensee Event Report details two events which occurred at 1323 CDT on 9/2/88 and at 1240 CDT on 9/3/88. The first event was an automatic Reactor Protection System (RPS) (1) reactor trip which occurred due to Steam Generator (S/G) (2) low level followed by an Engineered Safety Features (ESF) (3) actuation by design. These were a Feedwater Isolation (FWIS) and an Auxiliary Feedwater Actuation (AFAS). During the subsequent return to power operations, the second event occurred which resulted in another automatic FWIS and AFAS. This report is submitted pursuant to 10CFR50.73(a)(2)(iv) to report the automatic actuations of the RPS and ESF.

#### Conditions at Time of Events

##### Event 1:

Mode 1 - Power Operations

Reactor Power - 100%

Reactor Coolant System (RCS) (4) - temperature (average) - 588 Degrees F  
pressure - 2243 psig

##### Event 2:

Mode 1 - Power Operations

Reactor Power - 8%

#### Background

An ESF actuation at Browns Ferry 1 (Docket No. 50-259) reported via 86-029, spurred an evaluation of potential transformer (PT) cabinets (5) at Callaway. This evaluation proposed that the cabinets should be labeled or locked to prevent personnel from inadvertently de-energizing the transformers. Labels were placed on all switchgear PT cabinet drawers in December, 1987. The labels read, "WARNING - NOTIFY CONTROL ROOM PRIOR TO OPENING. DE-ENERGIZATION OF ELECTRICAL CIRCUITS WILL OCCUR IF THIS DOOR IS OPENED." These labels were also included in the Equipment Operator (EO) training lesson plan. However, actual

electrical equipment response upon opening the PT drawer was not covered.

#### Description of Event 1

On 9/2/88, while performing On the Job Training (OJT) for Assistant Equipment Operators (AEO), a non-licensed EO opened the potential transformer cabinet drawer for the 4.16 kV station service bus, PBO3. (6) The PT fuses, (7) which are connected to the cabinet drawer, were disconnected when the drawer was opened. This generated an undervoltage signal for the bus and

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resulted in the de-energization of the PBO3 loads. These loads included 2 of the plant's 3 condensate pumps (8) and 1 of 2 heater drain pumps.(9) S/G levels began to decrease due to the low condensate flow and subsequent low feed flow until the reactor trip occurred on a 'C' S/G lo-lo level trip setpoint. A FWIS and an AFAS occurred as designed following the reactor trip. The licensed operators recovered from the reactor trip via plant procedures.

#### Root Cause

The root cause of this event is attributable to cognitive personnel errors. The EO did not understand the function of the PT fuses relative to the PBO3 bus. He mistakenly thought the PT fuses only affected the spare breaker located immediately below them. Because the spare breaker was de-energized, he assumed the PT fuses were de-energized as well. In accordance with the warning label affixed to the PT cabinet door, the EO called the control room for authorization to open the PT fuse drawer. The licensed Reactor Operator (RO) misunderstood the EO's intended action. The RO thought the EO was requesting permission to open the spare breaker panel rather than to open the PT drawer, and therefore gave authorization to do so.

#### Corrective Actions

Switchgear PT drawers will be locked with a common key to be kept in the Control Room. The training program will be revised for operations personnel to include the function of PT's and the interlocks associated with the PT drawers. Progressive discipline has been initiated with the individuals involved.

#### Description of Event 2

During the subsequent startup from Event,1 at approximately 1240 CDT on 9/3/88, main Feedwater Regulating Valve (12) FRV), AE-FCV-540 for the 'D' S/G was placed in service in preparation for the main generator (13) synchronization and a power increase. During this operation, FRV seat leakage caused high

feedwater flow to the 'D' S/G. In an attempt to reduce the 'D' S/G level, the licensed operators isolated the FRV by closing the upstream feedwater isolation valve AE-V-76. 'D' S/G level swelled to the hi-hi level trip setpoint (78%). This caused a FWIS and an AFAS of both motor driven auxiliary feedwater pumps (15). The ESF equipment was verified as having properly actuated and the signals were reset to their normal position. The plant achieved Mode 1 at 1307 on 9/3/88 and returned to full power by 2100 on 9/5/88.

#### Root Cause

The high 'D' S/G level was caused by excessive seat leakage of the 'D' FRV. The leakage is believed to be the result of either degradation of the valve seating surface or the valve plug not fully seating upon closure.

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#### Corrective Actions

- (1) A visual inspection and stroke of the 'D' FRV did not indicate any apparent problems with valve stroke limits.
- (2) A caution tag was placed on the 'D' FRV at the Main Control Board to warn operators that the valve leaks excessively.
- (3) A work request was initiated to investigate seat leakage on the 'D' FRV. The work is to be performed on the 'D' FRV during the next refueling outage. At that time, the valve will be disassembled, visually examined, and if required corrective maintenance will be performed.

#### Safety Significance

The RPS and ESF systems stated above performed as designed following the events. There was no radiological release. These events posed no threat to the public health and safety.

#### Previous Occurrences

None.

#### Footnotes

The system and component codes below are from IEEE Standards 805-1983 and 803A-1983, respectively.

- (1) System - JC
- (2) System - AB, Component - SG

- (3) System - JE
- (4) System - AB
- (5) System - EA, Component - CAB
- (6) System - EA, Component - BV
- (7) System - EA, Component - FV
- (8) System - SD, Component - P
- (9) System - SN, Component - P
- (10) System - SJ, Component - P
- (11) System - SB, Component - SG
- (12) System - SJ, Component - FCV
- (13) System - TB, Component - GEN
- (14) System - SJ, Component - ISV
- (15) System - BA, Component - P

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UNION ELECTRIC

Callaway Plant October 3, 1988

U. S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

ULNRC-1838

Gentlemen:

DOCKET NUMBER  
50-483  
CALLAWAY PLANT UNIT 1  
FACILITY OPERATING LICENSE NPF-30  
LICENSEE EVENT REPORT 88-010-00  
REACTOR TRIP DUE TO PERSONNEL ERROR AND  
ENGINEERED SAFETY FEATURES ACTUATIONS DUE TO VALVE LEAKAGE

The enclosed Licensee Event Report is submitted pursuant to 10CFR50.73 (a) (2) (iv) concerning two events. The first event was an unplanned reactor trip on low Steam Generator level with subsequent actuations of Engineered Safety Features. The second event was the automatic actuation of Engineered Safety Features during the return to power operations.

J. D. Blosser  
Manager, Callaway Plant

TPS/PSP/JKB:Jlh

Enclosure

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ATTACHMENT 1 TO 8810060324 PAGE 2 OF 2

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